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(54) **PROTECTIVE ROLL GUARD FOR CLEARING OBSTACLES FROM CASTER WHEELS**

SCHUTZVORRICHTUNG VOR HINDERNISSEN FÜR LENKROLLEN

GUIDE-GALET DE PROTECTION PERMETTANT A DES ROULETTES DE FRANCHIR LES  
OBSTACLES

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(56) References cited:  
**CH-A- 633 996** **US-A- 4 176 756**  
**US-A- 5 170 528** **US-A- 5 371 920**  
**US-A- 5 385 373**

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**Description**Field of the Invention

**[0001]** This invention relates to the field of roll guards or protective devices for wheels, i.e., devices intended to clear obstacles such as electrical wires, cords, tubing, etc., from the rolling path of a wheel so as to prevent obstruction of the rolling movement of the wheel.

Background of the Invention

**[0002]** Modern day hospital operating room floors are cluttered with many kinds of hoses and electrical cords for such equipment as electrocardiographs, pulse oximeters, CO<sub>2</sub> monitors, and other diagnostic equipment.

**[0003]** Heavy anesthesia machines, usually mounted on a large cart containing devices for delivering and monitoring the administration of anesthetic to a patient, are difficult to move about through the clutter of cords and tubing. In rare instances, cart wheels may catch on tubing, accidentally disconnecting patients from breathing systems. In other instances, people have been injured when the wheels of anesthesia carts were jammed or even snapped off by the clutter of cords, causing the anesthesia machines to fall on patients and doctors.

**[0004]** These same difficulties can arise with caster wheeled equipment in other environments, such as mobile computer tables, mobile test equipment such as in electrical engineering environments, and for mobile industrial equipment.

**[0005]** One solution to this problem appears in U.S. Patent No. 5,170,528 to Navar et al. The Navar device is a complicated arrangement, having many parts, in which a wheel is embraced within a system of rollers surrounded by an obstacle-clearing shield. One problem with the Navar device arises from the fact that it is not easily disassembled. Whenever there is a need to install or remove the device from a cart wheel, either numerous locking pins and interlocks must be installed or removed, or the heavy anesthesia cart must be lifted onto or off of the device, thereby creating a possibility for an accident to occur. Another problem posed by the Navar device arises from the system of rollers, which may pick up dirt, hair, or other debris. Debris in the rollers creates the potential for jamming the rollers, thereby transforming the obstacle-clearing device of Navar into the very obstacle that the device was meant to clear.

**[0006]** An additional obstacle clearing device which has been utilised consists of a simple cylindrical tubular shield which is cut from a length of plastic pipe. However, because of the solid, non-jointed nature of this shield, the entire anesthesia cart must be lifted to place or remove the shield around a wheel. Installation and removal thus presents risk of back injury or tipping of the machine.

**[0007]** We are aware of US Patent No. 5 371 920, which discloses a caster wheel guard in which the guard is separable into two portions held together with screws. It forms the pre-characterising portion of Claim 1.

Summary of the Invention

**[0008]** In one aspect, the invention provides a roll guard apparatus according to Claim 1, or optionally according to any of the dependent claims.

**[0009]** Typically, the present invention is directed to a roll guard for caster wheels. The inventive roll guard is of a generally cylindrical shape, and extends vertically from the floor surface up to a height near the point where the caster wheel is connected to a cart. The roll guard is manufactured as a single piece unit having two segments connected by an integral hinge. The hinge allows for the two segments of the roll guard to be opened or closed around the caster wheel, thereby allowing for the fitting or removal of the roll guard to a caster wheel without having to lift or move the cart. Additionally, the two segments of the roll guard are formed with integral lock elements which allow for the two segments of the roll guard to be joined into a rigid unit.

**[0010]** The roll guard may additionally be formed with a weighted lower lip, which lowers the center of gravity of the roll guard, thereby increasing its stability.

Brief Description of the Drawings

**[0011]** The foregoing aspects and many of the attendant advantages of this invention will become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a perspective view of a roll guard included for understanding of the present invention but not forming part of the invention, fitted around a typical cart-mounted caster wheel.

FIGURE 2 is a perspective view of the roll guard of FIGURE 1 in the fully open position, showing the integral hinge and lock elements formed in each segment of the roll guard.

FIGURE 3 is a perspective view of the roll guard of FIGURE 1 in the closed position showing the integral hinge, and

the interlocking of the integral lock elements.

FIGURE 4 is a top view of the roll guard of FIGURE 1 in the fully open position, showing the integral hinge and lock elements formed in each segment of the roll guard.

FIGURE 5 is a side view of the roll guard of FIGURE 1 in the fully open position, showing the edges of the segments of the roll guard, the integral hinge, and the integral lock elements formed in the segments of the roll guard.

FIGURE 6 is a cutaway top view of the integral hinge of the roll guard of FIGURE 1.

FIGURE 7 is a perspective exploded view of a first embodiment of the present invention. The roll guard is formed of two separate pieces, and the integral lock elements are vertically extending tabs and slots.

FIGURE 8 is a perspective view of a second alternative embodiment included for an understanding of present invention but not falling within it. The roll guard is formed from two separate segments, and the integral lock elements are formed as horizontally extending tabs and slots. Additionally, integral pegs and sockets are formed in the segments of the roll guard to aid in aligning the segments for closure.

#### Detailed Description of the Preferred Embodiment

**[0012]** A roll guard 10 according an embodiment included for understanding present invention but not forming part of it essentially forms a protective sleeve around a caster wheel 100 when the roll guard is fitted in place around the caster wheel. FIGURE 1 depicts a typical caster wheel 100 connected to a support member 120 and lower tray 110 of a cart 130. Surrounding the caster wheel 100, and resting on the floor is a first preferred embodiment of a roll guard 10 according to the present invention.

**[0013]** The roll guard 10 is formed from a first semi-cylindrical half segment 12 joined to a second semi-cylindrical half segment 14 by a longitudinally oriented integral hinge 16 (FIGURES 1 and 2). The half segments 12 and 14 are connected in opposing disposition by the hinge 16, which joins first adjacent longitudinal edges of the half segments 12, 14. Second adjacent longitudinal edges of the half segments 12, 14 include integral locking elements 18. The half segments 12, 14 are movable relative to each other, by flexing the hinge 16, between an open configuration (FIGURE 2) and a closed, cylindrical sleeve configuration (FIGURE 1), in which configuration they are selectively secured by the locking elements 18. In the closed configuration, the roll guard 10 surrounds and clears obstacles from the caster wheel 100. When the cart is moved, the caster wheel 100 pushes against an inner wall 20 of the roll guard 10, causing the roll guard 10 to slide along the floor with the caster wheel 100. An outer wall 22 of the roll guard 10 precedes the wheel, thereby pushing any obstacles out of the way. The roll guard 10 is formed from a material sufficiently rigid to withstand deformation from repeated encounters with both a rolling caster wheel and a variety of different obstacles that may be encountered. Additionally, the roll guard 10 material should be chosen and finished so as to reduce frictional resistance from the floor and from the rolling caster wheel. Preferred materials include thermoplastic polymers, as shall be described subsequently, but thermosetting polymers and metals may alternately be utilized.

**[0014]** In the illustrated embodiment the roll guard 10 is generally cylindrical in shape. When fitted in place around the caster wheel 100, the central axis of the cylindrical roll guard 10 is generally perpendicular with both the plane of the floor and with the rotational axis of the caster wheel (which will be generally parallel to the plane of the floor). The height of the roll guard 10 is determined so as to provide sufficient protection to the caster wheel, while still being low enough as to avoid interference with the lower tray of the cart. As shown in FIGURE 1, the height of the roll guard 10 preferably exceeds the height of the caster wheel in order to reduce the chance of the roll guard 10 tipping over. The minimum inside diameter inner wall 20 of the roll guard 10 is slightly larger than the diameter of the caster wheel such that the caster wheel may rotate about its axis of rotation and swivel relative to support member within the roll guard 10. Likewise, the roll guard 10 can freely rotate about and relative to the caster wheel which it surrounds.

**[0015]** The roll guard 10 of the embodiment is molded, machined or otherwise formed as a single unitary piece. In the closed configuration of FIGURES 1 and 3, the roll guard 10 defines a smooth, straight, vertical outer wall 22 and a substantially flat upper edge 24 which is beveled along its juncture with the inner wall 20 of the roll guard 10. The inner wall 20 is smooth and substantially straight, like the outer wall 22 but slants slightly inwardly, toward the central axis of the roll guard 10.

**[0016]** The lower quarter to third of the inner wall 20 of the roll guard 10 flares in toward the central axis of the roll guard 10 to form a weighted internal lip 26 for reducing the center of gravity of the unit, thereby increasing stability. The lip 26 is formed such that the lip 26 does not interfere with the movement of the caster wheel. The roll guard 10 has a circular bottom edge 28 joining the inner and outer walls 20, 22 of the roll guard 10 that provides a substantially flat and smooth sliding surface.

**[0017]** Those skilled in the art will recognize that other overall shapes for the roll guard 10 may be utilized. For example, the roll guard 10 could define an oval or rectangular tube, rather than a circular tube. Further, the weighted lip 26 could be eliminated or formed on the outer wall 22, and sizes, as well as other weighted lip arrangements, such as lips extending outward, without departing from the spirit of the present invention.

**[0018]** Referring to FIGURES 2-6, the embodiment of the roll guard 10 is formed by casting or molding the roll guard

as a single, integral unit, a portion of which forms a first half segment 12, another portion of which forms a second half segment 14, and a further portion defining the integral hinge 16 joining the two half segments 12, 14. The hinge 16 is preferably formed as a very thin section of the roll guard material (FIGURE 6) that is integrally cast or molded between the two segments 12, 14. When the roll guard 10 opens or closes by moving the half segments 12, 14 relative to each other, the material of the resulting "living" hinge 16 bends, undergoing plastic deformation. To avoid failure of the hinge 16 due to repeated opening and closing, the interfaces between the hinge 16 and either half segments 12, 14 is formed as a fillet to avoid stress points which might increase the likelihood of cracking or tearing.

**[0019]** To further protect the hinge 16 from damage, support pins 31 and corresponding support recesses 33, and an alignment peg 35 and corresponding alignment receptacle 37 are provided in longitudinal edges 30 and 32, respectively. When the roll guard 10 is in the closed position, support pins 31 interlock with corresponding support recesses 33, and alignment peg 35 interlocks with corresponding alignment receptacle 37 to prevent the two half segments from moving relative to each other, thereby reducing stress on the hinge 16. While two sets of support pins and corresponding support recesses, 31 and 33 respectively, are depicted, with both support pins 31 being located in the second half roll guard 14 and both corresponding support recesses 33 being located in the first half roll guard 12, it is noted that the number of corresponding support pins 31 and support recesses 33 could be more or less, and the disposition of support pins 31 and corresponding support recesses 33 in the first and second half roll guards, 12 and 14 respectively, could be varied without departing from the spirit of the invention.

**[0020]** Additionally, because the roll guard 10 of the embodiment is formed as a single unit, the thin section of material that forms the hinge 16 must be resilient enough to withstand repeated deformations from opening and closing the roll guard 10 without breaking or tearing. A preferred material is a resilient thermoplastic polymer which is relatively rigid in thick sections, and resiliently compliant in thin sections. Suitable materials include polypropylene or a polyamide, (i.e., nylon). Those skilled in the art will recognize that the preferred embodiment may alternatively be constructed from two separate half segments 12, 14 joined by a permanently attached hinge (not shown), such as piano hinges, pivot pins, or nylon straps attached with screws, nails, rivets, adhesives, or in any other manner. However, integral formation of the hinge 16 with the two half segments 12, 14 is preferred due to simplicity and cost considerations.

**[0021]** FIGURES 2, 4 and 5 depict the roll guard 10 in the fully open configuration for installation and removal, (i.e., where hinge 16 is in its normal, or non-deformed state), as is also shown in FIGURE 6. In this position, it can be seen that the embodiment of the roll guard 10 is formed of two semi-circular half-cylindrical half segments 12, 14 sitting side-by-side. The longitudinal edges of each semi-cylindrical half segments 12, 14 are preferably flat and perpendicular to the floor and oriented radially relative to a central axis of each half segment 12, 14. A first longitudinal edge 30 of each half segment 12, 14 is joined along the radially oriented extremity by the integral hinge 16. A second longitudinal edge 32 of each half segment 12, 14 is spaced far apart in the open configuration (FIGURES 2 and 4) and adjacent each other in the closed configuration (FIGURES 1 and 3). In the closed configuration, the edges 30 contact each other and the edges 32 contact each other in opposing disposition.

**[0022]** The locking elements 18 are preferably integrally formed on the second edge 32 of each half segment 12, 14 in opposing disposition for automatic engagement when the half segments 12, 14 are moved to the closed configuration. In the preferred embodiment illustrated, the second edge 32 of the first half segment 12 includes a locking tab 18a projecting normally from the second edge 32, i.e., in a direction tangential relative to the cylindrical shape of the closed roll guard 10. The locking tab 18a is configured generally as a flat flange, and engages with a corresponding locking slot 18b defined within the second edge 32 of the second half segment 14, as will be described subsequently. The locking tab 18a and locking slot 18b cooperatively form the integral locking elements 18.

**[0023]** Referring to FIGURE 2, the locking tab 18a extends from just above the bottom edge 28 of the roll guard 10, one quarter to one third along the height of the roll guard, and has a thickness of one sixth to one quarter the width of the end. As depicted in FIGURE 4, the locking tab 18a is preferably located approximately one quarter the distance from the outer wall 22 to the inner wall 20. The thickness of the locking tab 18a gradually tapers from the second edge 32 of the first half segment 12, terminating in an enlarged catch 34 formed along the extreme longitudinal edge of the locking tab 18a. The catch 34 is wider than the adjacent portion of the locking tab 18a, forming an outwardly extending hook when viewed along the longitudinal axis of the roll guard 10. The width of the catch 34 at its broadest point is preferably the same as the width of the base of the locking tab 18a as it projects from the edge 32.

**[0024]** The integral rectangular locking slot 18b formed within the second half segment 14 of the roll guard 10 is contoured correspondingly to the locking tab 18a in the first half segment 12. The locking slot 18b thus forms a rectangular aperture in the second edge 32 of the second half segment 14, extending normally from the second edge 32 into the interior of the second half segment 14. The extreme end of the locking slot 18b expands in width to define an aperture 36 in the outer wall 22. The locking slot 18b defines a shoulder 38 adjacent the aperture 36, which receives and retains the catch 34 when the locking tab 18a is fully inserted into the locking slot 18b. Specifically, as the first and second half segments 12, 14 are joined, the catch 34 of the locking tab 18a enters the locking slot 18b. The catch 34 rides along the interior of the locking slot 18b, causing the locking tab 18a to resiliently flex along its length. As the roll guard 10 is fully closed, the catch 34 reaches the shoulder 38, and the locking tab 18a snaps resiliently back to its unflexed config-

uration. When the first and second half segments 12, 14 are in the closed position, as shown in FIGURE 3, the locking tab 18a is received and is lockably engaged in the locking slot 18b, and the catch 34 engages with the shoulder 38 to prevent removal of the locking tab 18a from the locking slot 18b, thereby securing the two half segments 12, 14 together.

[0025] As shown in FIGURE 4, the locking slot 18b is preferably tapered inwardly at the entrance of the locking slot 18b to permit the locking tab 18a to be more easily inserted, as well as to allow for manufacturing tolerances and possible deformations from prolonged use. Additionally, the base of the locking tab 18a may be provided with a ramp (not shown) which corresponds to the taper in the locking slot 18b such that locking tab 18a and locking slot 18b are in contact with each other for the full length of the locking tab 18a when the roll guard 10 is closed, thereby providing additional support for the structure and reducing possible stresses on the hinge 16. After assembly to the locked configuration, the catch 34 of the locking tab 18a can be accessible through the aperture 36 in the outer wall 22 of the second half segment 14, in order to facilitate manual depression of the locking tab 18a to permit selective unlocking of the first and second half segments 12, 14.

[0026] Those skilled in the art will recognize that other forms of integral locking mechanisms than the tab and slot arrangement of the embodiment may be employed. Specifically contemplated alternative embodiments include a locking tab with pawl-like teeth engaging a locking slot or recess with one or more locking ridges (not shown), and a locking post and ball arrangement inserted into a corresponding receptacle having a slightly smaller entry diameter than the ball (not shown). Regardless of the exact formation, the locking mechanism is integrally formed and preferably automatically engaged for simplicity and reliability.

[0027] FIGURE 7 depicts a first embodiment of a roll guard 10 constructed in accordance with the present invention. In this embodiment the first and second sleeve portions comprising two semi-cylindrical half segments 42, 43 are formed as two separate pieces. Instead of including an integral hinge, each longitudinal edge of the segments 42, 43 includes a locking mechanism. Specifically, the longitudinal edge of the first half segment 42 is formed stepwise to define two horizontally disposed first or lower shoulders 44. Each horizontally disposed lower shoulder 44 includes an integral locking tab 46. Each locking tab 46 corresponds to the locking tab 18a of the roll guard 10, except that the locking tabs 46 extend longitudinally, i.e., vertically, rather than horizontally.

[0028] The second half segment 43 has longitudinal edges which are stepped inversely and corresponding to the first half segment 42, thus defining corresponding upper shoulders 48. Each upper shoulder 48 defines a surface ridge of the form of a second or a locking slot 50. Each locking slot 50 is contoured corresponding to the locking slot 18b of the roll guard 10, except that the locking slots 18b extend longitudinally, i.e., vertically, and over onto the top edge 52 of the half segment 43. Additionally, the locking tabs 46 and locking slots 50 of the roll guard 40 are preferably formed arcuately, curving slightly about the longitudinal axis of the roll guard 40. The completed roll guard 40 is formed by sliding the second half segment 43 down atop the first half segment 42, such that upper shoulders 48 rest on lower shoulders 44, respectively, and locking tabs 46 are inserted into locking slots 50. In this closed configuration, half segments 42, 43 are locked together to define a complete cylinder. In the preferred embodiment, the upper catch ends 54 of the locking tabs 46 are accessible through the top edge 52 of the second half segment 43 in order to facilitate selective unlocking of the roll guard 40.

[0029] FIGURE 8 depicts a second embodiment of a roll guard 60 included to aid understanding of the present invention but not forming part of it. The complete roll guard is formed of two separate half segments 62, 64. Each half segment 62, 64 is preferably a semicircular half-cylinder and is the mirror image of the other, in order to reduce manufacturing costs. The roll guard 60 is identical to the previously described roll guard 10, except that the half segments 62 and 64 are separately formed, and there is no integral hinge. Two sets of locking elements are instead provided.

[0030] Specifically, each half segment 62, 64 includes a horizontally extending integral locking tab 66 on one longitudinal edge, and a matching locking slot 68 formed within the other longitudinal edge. The locking tabs 66 and locking slots 68 are otherwise configured and located as they would be in the roll guard of FIGURES 1-5. The complete roll guard is formed by inserting the locking tabs 66 of the two mirrored half segments into the corresponding locking slots 68 of the other mirrored half segments in locking engagement. Additionally, to facilitate alignment, each half segment 62, 64 is fitted with an alignment peg 70 spaced above the locking tab 66, and a corresponding alignment receptacle 72. The alignment peg 70 of each half segment 62, 64 is slidably received within the corresponding alignment receptacle 72 to longitudinally stabilize the two half segments when locked.

[0031] Alternate embodiments of roll guards 40 and 60 share in common with the roll guard 10 the integral formation of locking elements that enable selective automatic locking of roll guard segments without the need to assemble separate pins, screws, bolts or other hardware. While each of the embodiments described above utilizes semi-cylindrical (i.e., 180°) segments, the segments need not match in size, just so that the roll guard may be removed from the caster wheel in the open configuration without the need of lifting the caster wheel. Thus, one segment could be greater than 180°, with the other less than 180°, while still being within the scope of the present invention.

## Claims

1. A roll guard apparatus (40) for use with a caster wheel (100) to clear obstacles away from a rolling path of the caster wheel (100) along a floor, the apparatus comprising:

a first sleeve portion (42) positionable to be supported on the floor and to partially encircle the caster wheel (100), and  
 a second sleeve portion (43) being positionable to be supported on the floor and to partially encircle the caster wheel (100), **characterised in that**  
 the first sleeve portion (42) has a first lock element (46) integral with the first sleeve portion;  
 the second sleeve portion (43) has a second lock element (50) integral with the second sleeve portion (43) ;  
 the first sleeve portion (42) and the first lock element (46) are formed as a single unit;  
 the second sleeve portion (43) and the second lock element (50) formed as a single unit; and  
 the second lock element (50) selectively, engages the first lock element (46) to releasably interlock the first (42) and second (43) sleeve portions into a sleeve which completely encircles the caster wheel (100),

wherein the first lock element (46) comprises at least one vertical tab (46) and the second lock element (50) comprises at least one corresponding surface ridge (50) the tab (46) being insertable past the corresponding surface ridge (50) for selective locking engagement therebetween, and wherein the first (42) and second (43) sleeve portions define corresponding first (44) and second (48) shoulders, respectively, that abut each other upon locking, and wherein the first vertical tab (46) extends from the first shoulder (44) that engages a first surface ridge (50) defined adjacent the second shoulder (48).

2. The apparatus of any preceding Claim, wherein the tab (46) of the first lock element (46) defines a stop protuberance (54) for engaging the corresponding surface ridge of the second lock element (50).

3. The apparatus of Claim 2, wherein the second sleeve portion (43) defines a slot (50), the surface ridge is formed within the slot, and the tab (46) of the first sleeve portion is insertable into the slot (50) for selective locking.

4. The apparatus of any preceding Claim, wherein the lower portion of the sleeve further comprises a weighted lip formed around an edge of the sleeve, and in contact with the floor.

5. The apparatus of Claim 4, wherein the weighted lip flares inwardly toward the caster wheel (100) when the apparatus encircles the caster wheel (100).

6. The apparatus of any preceding Claim, wherein the first (42) and second (43) sleeve portions further define corresponding third (44) and fourth (48) shoulders, respectively, that abut each other upon locking, and wherein the first lock element (46) further comprises a second vertical tab (46) extending from the third shoulder (44) that engages a second surface ridge (50) defined adjacent the fourth shoulder (48).

7. The apparatus of Claim 6, wherein the second lock element comprises first and second vertical slots (50) corresponding to the first and second vertical tabs (54), the first and second vertical slots (50) being defined in the second and fourth shoulders (48) formed by the second sleeve portion (43), respectively, the first and second vertical tabs (54) being selectively receivable with the first and second vertical slots (50), respectively, in locking engagement, such that the first and third shoulders (44) of the first sleeve portion (42) cooperate with the second and fourth shoulders (48) of the second sleeve portion (43) to form the sleeve.

8. The apparatus of Claim 7, wherein the first (44), second (48), third (44) and fourth (48) shoulders are horizontally disposed.

9. The apparatus of any preceding Claim, wherein the sleeve portions cooperatively comprise a cylindrical shell, and the first (42) and second (43) sleeve portions comprise semi-cylindrical shells.

10. The apparatus of any preceding Claim, wherein the sleeve portions are configured such that the interlocked sleeve portions can freely rotate about the encircled caster wheel (100).

## Patentansprüche

1. Rollenschutzvorrichtung (40) zur Verwendung mit einem Schwenkrollenrad (100), um Hindernisse aus einem Rollpfad des Schwenkrollenrades (100) entlang eines Bodens zu räumen, wobei die Vorrichtung folgendes aufweist:
 

5 einen ersten Hülsenabschnitt (42), welcher derart positionierbar ist, dass er auf dem Boden gestützt werden kann und das Schwenkrollenrad (100) teilweise umgibt, und

einen zweiten Hülsenabschnitt (43), welcher derart positionierbar ist, dass er auf dem Boden gestützt werden kann und das Schwenkrollenrad (100) teilweise umgibt, **dadurch gekennzeichnet, dass**

10 der erste Hülsenabschnitt (42) ein erstes, mit dem ersten Hülsenabschnitt integrales Verriegelungselement (46) hat;

der zweite Hülsenabschnitt (43) ein zweites, mit dem zweiten Hülsenabschnitt integrales Verriegelungselement (50) hat;

15 der erste Hülsenabschnitt (42) und das erste Verriegelungselement (46a) als eine einzige Einheit ausgebildet sind;

der zweite Hülsenabschnitt (43) und das zweite Verriegelungselement (50) als eine einzige Einheit ausgebildet sind; und

das zweite Verriegelungselement (50) selektiv an dem ersten Verriegelungselement (18a) angreift, um den ersten und den zweiten Hülsenabschnitt (42, 43) miteinander lösbar zu einer Hülse zu verriegeln, die das Schwenkrollenrad (100) vollständig umgibt, wobei das erste Verriegelungselement (46a) wenigstens eine vertikale Lasche (46) aufweist und das zweite Verriegelungselement (50) wenigstens eine entsprechende Oberflächenrippe (50) aufweist, wobei die Lasche (46) an der entsprechenden Oberflächenrippe (50) vorbei zum selektiven Verriegelungseingriff dazwischen einführbar ist, und wobei der erste und der zweite Hülsenabschnitt (42, 43) eine entsprechende erste und zweite Schulter (44 bzw. 48) bilden, die beim Verriegeln aneinander anliegen, und wobei sich die erste vertikale Lasche (46) von der ersten Schulter (44) erstreckt, die an einer ersten Oberflächenrippe (50) angreift, welche angrenzend an die zweite Schulter (48) gebildet ist.
2. Vorrichtung nach Anspruch 1, bei welcher die Lasche (46) des ersten Verriegelungselements (18a) eine Anschlagprotuberanz (54) zum Angreifen an der entsprechenden Oberflächenrippe des zweiten Verriegelungselements (18b) bildet.
3. Vorrichtung nach Anspruch 2, bei welcher der zweite Hülsenabschnitt (43) einen Schlitz (50) bildet, die Oberflächenrippe innerhalb des Schlitzes ausgebildet ist und die Lasche (46) des ersten Hülsenabschnitts zum selektiven Verriegeln in den Schlitz (50) einführbar ist.
4. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher der untere Abschnitt der Hülse ferner eine beschwerte Lippe aufweist, die um eine Kante der Hülse und in Kontakt mit dem Boden ausgebildet ist.
5. Vorrichtung nach Anspruch 4, bei welcher sich die beschwerte Lippe nach innen zu dem Schwenkrollenrad (100) aufweitet, wenn die Vorrichtung das Schwenkrollenrad (100) umgibt.
6. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher der erste und der zweite Hülsenabschnitt (42, 43) ferner eine entsprechende dritte und vierte Schulter (44 bzw. 48) bilden, die beim Verriegeln aneinander anliegen, und bei welcher das erste Verriegelungselement (18a) ferner eine zweite vertikale Lasche (46) aufweist, die sich von der dritten Schulter (44) erstreckt und an einer zweiten Oberflächenrippe (50) angreift, die angrenzend an die vierte Schulter (48) gebildet ist.
7. Vorrichtung nach Anspruch 6, bei welcher das zweite Verriegelungselement einen ersten und einen zweiten vertikalen Schlitz (50) in Entsprechung zu der ersten und der zweiten vertikalen Lasche (54) aufweist, wobei der erste und der zweite vertikale Schlitz (50) in der zweiten bzw. der vierten Schulter (48) gebildet sind, die durch den zweiten Hülsenabschnitt (43) ausgebildet sind, wobei die erste und die zweite vertikale Lasche (54) selektiv mit dem ersten bzw. dem zweiten vertikalen Schlitz (50) derart in Verriegelungseingriff aufnehmbar sind, dass die erste und die dritte Schulter (44) des ersten Hülsenabschnitts (42) mit der zweiten und der vierten Schulter (44) des zweiten Hülsenabschnitts (43) zusammenwirken, um die Hülse auszubilden.
8. Vorrichtung nach Anspruch 7, bei welcher die erste (44), die zweite (48), die dritte (44) und die vierte Schulter (48) horizontal angeordnet sind.

9. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher die Hülsenabschnitte zusammenwirkend eine zylindrische Schale aufweisen und der erste und der zweite Hülsenabschnitt (42, 43) halbzylindrische Schalen aufweisen.

5 10. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher die Hülsenabschnitte derart ausgestaltet sind, dass sich die miteinander verriegelten Hülsenabschnitte frei um das umgebene Schwenkrollenrad (100) drehen können.

## 10 Revendications

1. Appareil de guide-galet (40) destiné à une utilisation avec une roulette pivotante (100) pour franchir des obstacles à partir d'un trajet de roulement de la roulette pivotante (100) le long d'un sol, l'appareil comprenant :

15 une première portion de manchon (42) pouvant être positionnée pour être supportée sur le sol et pour encercler partiellement la roulette pivotante (100) et  
une seconde portion de manchon (43) pouvant être positionnée pour être supportée sur le sol et pour encercler partiellement la roulette pivotante (100),

### 20 caractérisé en ce que

la première portion de manchon (42) comporte un premier élément de verrouillage (46) solidaire de la première portion de manchon ;

la seconde portion de manchon (43) comporte un second élément de verrouillage (50) solidaire de la seconde portion de manchon (43) ;

25 la première portion de manchon (42) et le premier élément de verrouillage (46) sont formés comme une unité unique ;  
la seconde portion de manchon (43) et le second élément de verrouillage (50) sont formés comme une unité unique ;  
et

le second élément de verrouillage (50) met sélectivement en prise le premier élément de verrouillage (18a) pour interverrouiller de manière libérable les première (42) et seconde (43) portions de manchon en un manchon qui encercle complètement la roulette pivotante (100) dans lequel le premier élément de verrouillage (46) comprend au moins une patte verticale (46) et le second élément de verrouillage (50) comprend au moins une strie superficielle correspondante (50), la patte (46) pouvant être insérée au-delà de la strie superficielle correspondante (50) pour une mise en prise verrouillante sélective entre elles, et dans lequel les première (42) et seconde (43) portions de manchon définissent des premier (44) et deuxième (48) épaulements correspondants, respectivement, qui viennent en butée l'un contre l'autre lors du verrouillage, et dans lequel la première patte verticale (46) s'étend à partir du premier épaulement (44) qui met en prise une première strie superficielle (50) définie de manière adjacente au deuxième épaulement (48).

40 2. Appareil selon la revendication 1, dans lequel la patte (46) du premier élément de verrouillage (18a) définit une protubérance d'arrêt (54) pour mettre en prise la strie superficielle correspondante (50) du second élément de verrouillage (18b).

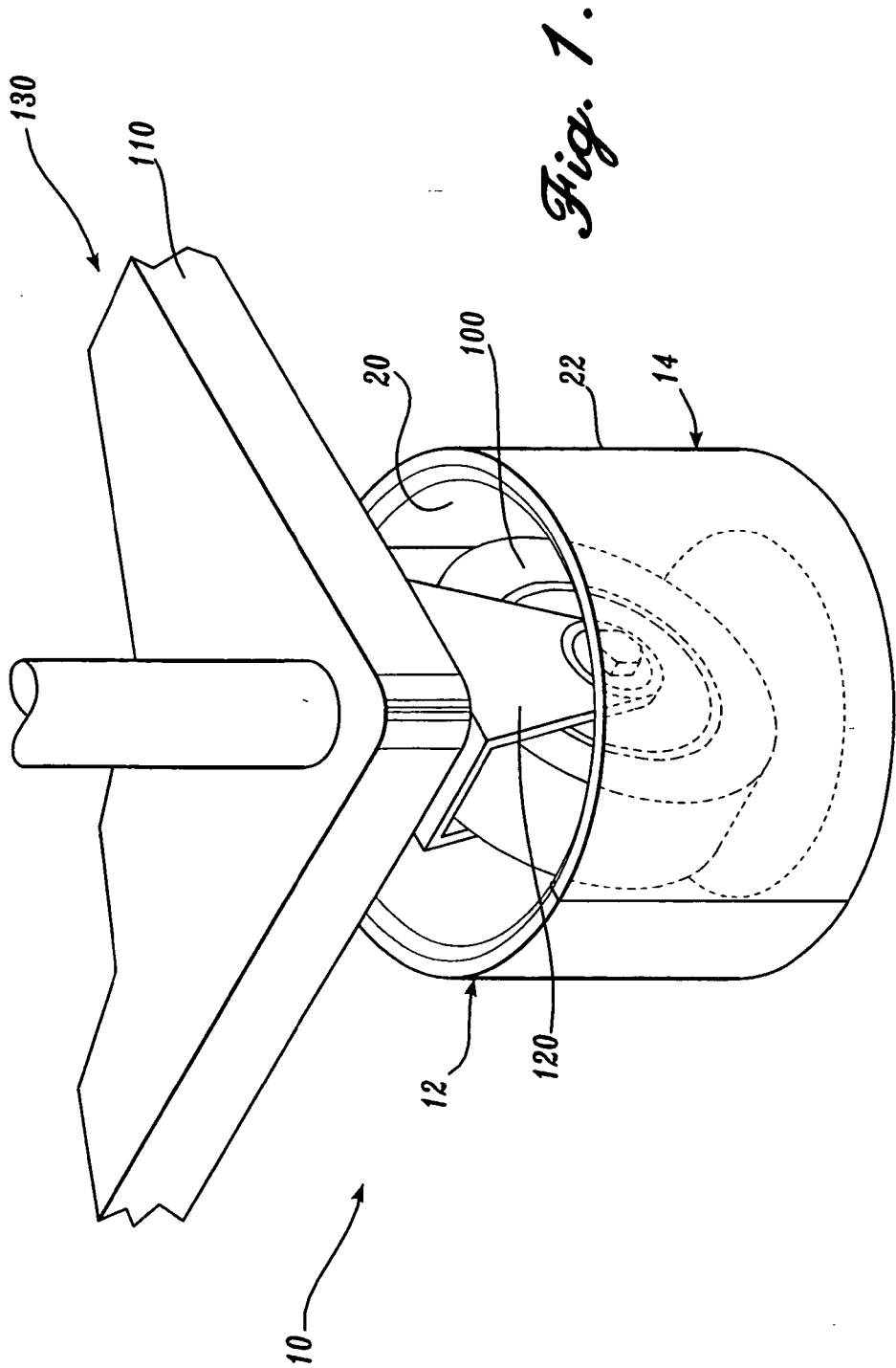
45 3. Appareil selon la revendication 2, dans lequel la seconde portion de manchon (43) définit une fente (50), la strie superficielle est formée au sein de la fente, et la patte (46) de la première portion de manchon peut être insérée dans la fente (50) pour un verrouillage sélectif.

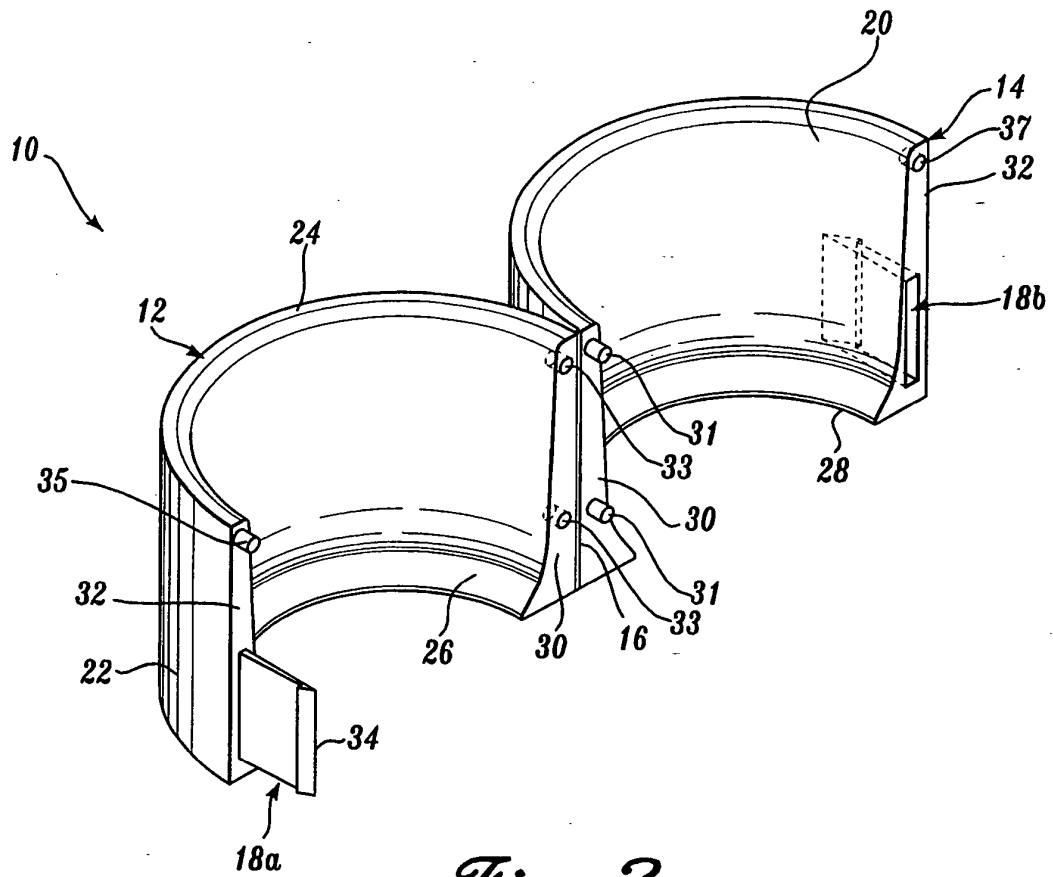
4. Appareil selon l'une quelconque des revendications précédentes, dans lequel la portion inférieure du manchon comprend en outre une lèvre pondérée formée autour d'un bord du manchon, et en contact avec le sol.

50 5. Appareil selon la revendication 4, dans lequel la lèvre pondérée s'évase vers l'intérieur vers la roulette pivotante (100) lorsque l'appareil encercle la roulette pivotante (100).

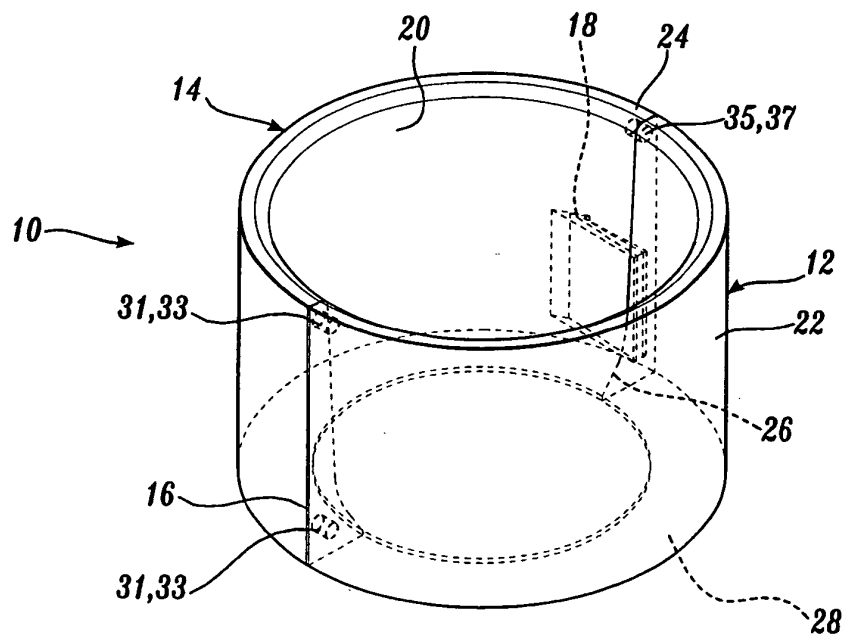
55 6. Appareil selon l'une quelconque des revendications précédentes, dans lequel les première (42) et seconde (43) portions de manchon définissent en outre des troisième (44) et quatrième (48) épaulements correspondants, respectivement, qui viennent en butée l'un contre l'autre lors du verrouillage, et dans lequel le premier élément de verrouillage (18a) comprend en outre une seconde patte verticale (46) s'étendant à partir du troisième épaulement (44) qui met en prise une seconde strie superficielle (50) définie de manière adjacente au quatrième épaulement (48).

7. Appareil selon la revendication 6, dans lequel le second élément de verrouillage comprend des première et seconde fentes verticales (50) correspondant aux première et seconde pattes verticales (54), les première et seconde fentes verticales (50) étant définies dans les deuxième et quatrième épaulements (48) formés par la seconde portion de manchon (43), respectivement, les première et seconde pattes verticales (54) pouvant être reçues sélectivement au sein des première et seconde fentes verticales (50), respectivement, en prise verrouillante, de telle sorte que les premier et troisième épaulements (44) de la première portion de manchon (42) coopèrent avec les deuxième et quatrième épaulements (44) de la seconde portion de manchon (43) pour former le manchon.
8. Appareil selon la revendication 7, dans lequel les premier (44), deuxième (48), troisième (44) et quatrième (48) épaulements sont disposés horizontalement.
9. Appareil selon l'une quelconque des revendications précédentes, dans lequel les portions de manchon comprennent en coopération une enveloppe cylindrique, et les première (42) et seconde (43) portions de manchon comprennent des enveloppes semi-cylindriques.
10. Appareil selon l'une quelconque des revendications précédentes, dans lequel les portions de manchon sont configurées de telle sorte que les portions de manchon interverrouillées peuvent tourner librement autour de la roulette pivotante encerclée (100) .

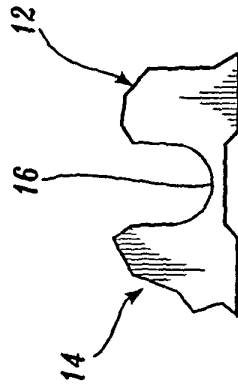
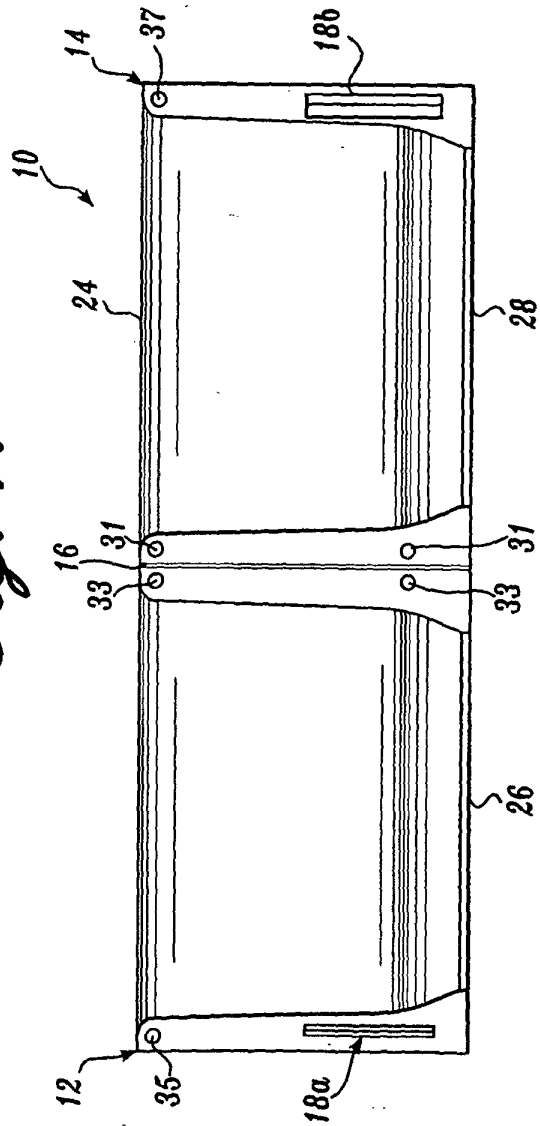
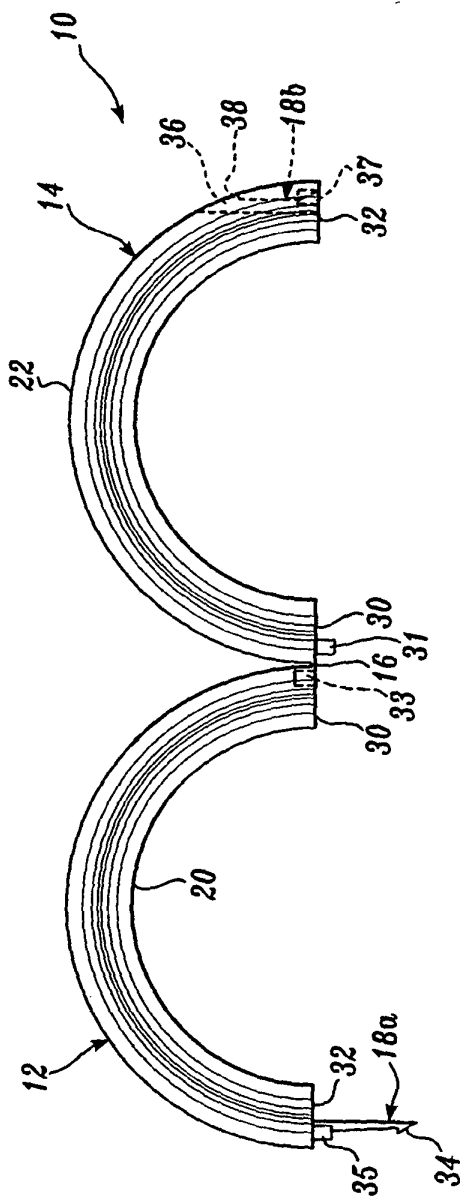


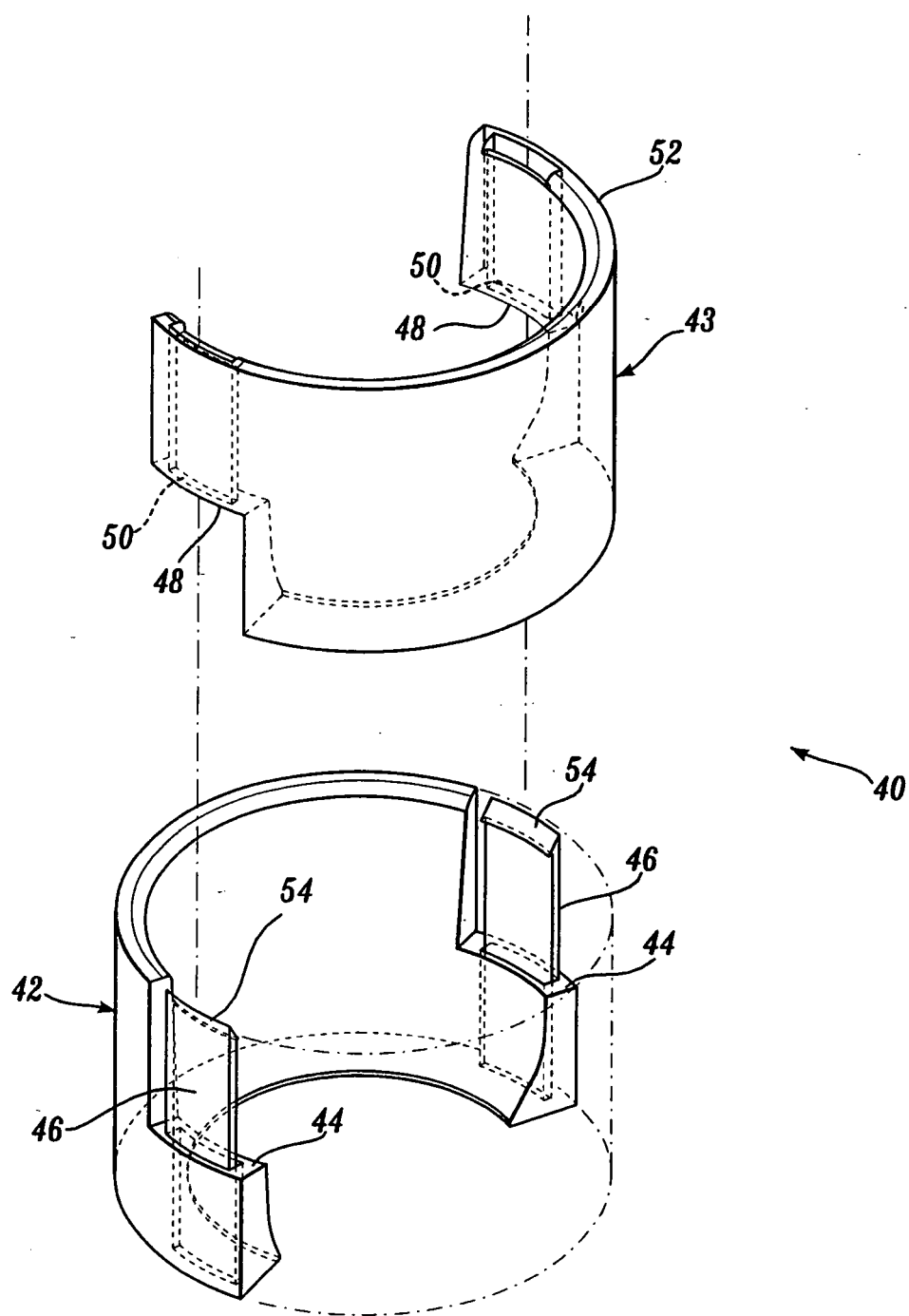


*Fig. 2.*

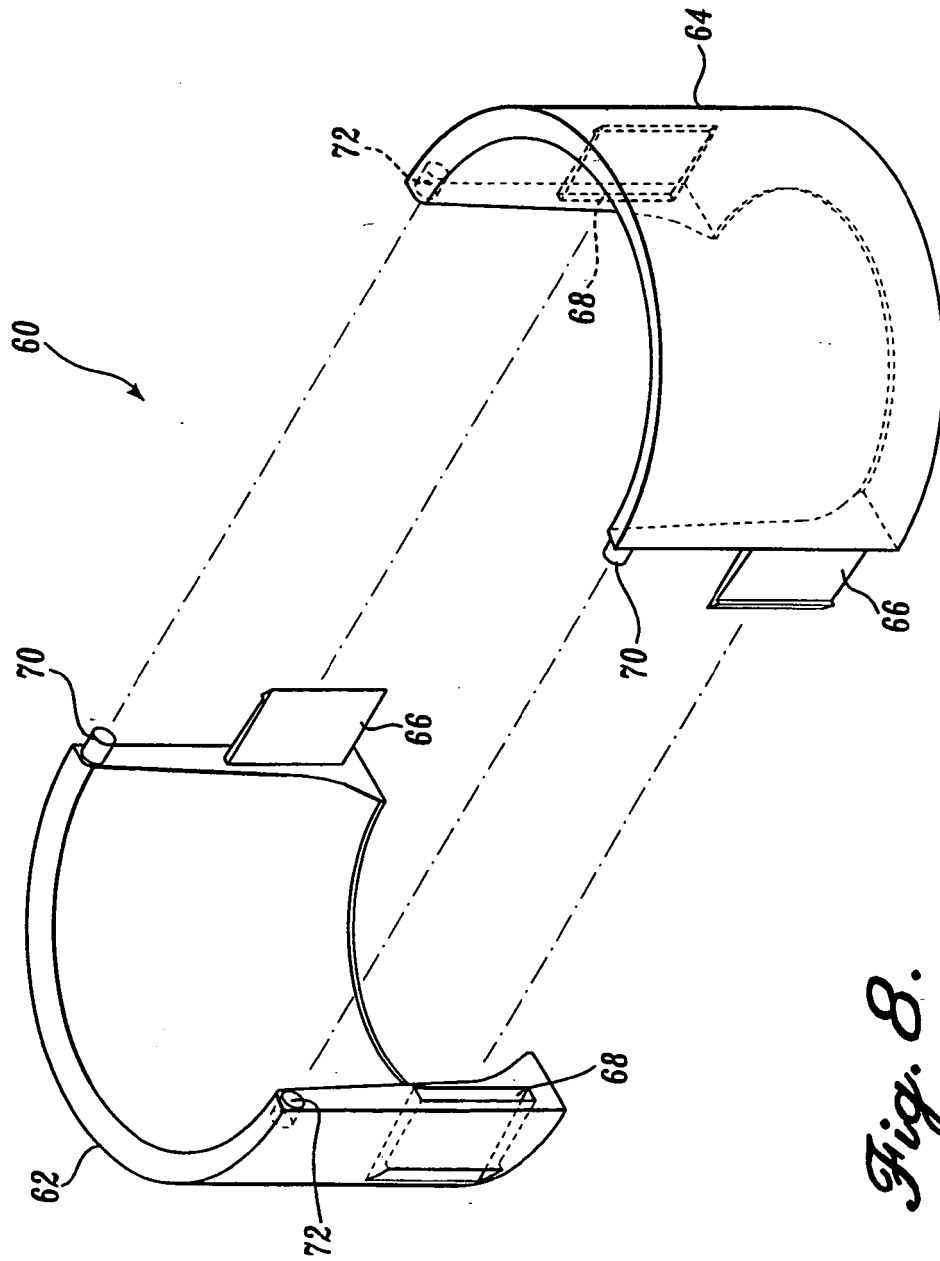


*Fig. 3.*





*Fig. 7.*



*Fig. 8.*